



REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 4-7 have been objected to as being in improper form; Claims 1-7 have been rejected under 35 U.S.C. § 112, second paragraph, as being vague and indefinite; Claim 1 has been rejected under 35 U.S.C. § 103 as being unpatentable over Henley et al in view of Kawanomoto et al and Hollemann; Claim 2 has been rejected under 35 U.S.C. § 103 as being unpatentable over Henley et al in view of Kawanomoto et al and further in view of Hollemann and Elson and Claim 3 has been rejected under 35 U.S.C. § 103 as being unpatentable over Henley et al in view of Kawanomoto et al and Hollemann and D'Souza. New Claims 8-27 have been added and thus Claims 1-27 remain active.

Considering first then the Examiner's objections to Claims 4-7, it is to be noted that such have now been amended so as to comply with U.S. patent practice and procedure, particularly with regard to proper dependency. Accordingly, favorable consideration of Claims 4-7 is believed to be in order and the same is hereby respectfully requested.

Considering next then the rejection of Claims 1-7 under 35 U.S.C. § 112, second paragraph, as being vague and indefinite, it is to be noted that such claims have now been amended for compliance with 35 U.S.C. § 112.

With respect to the Examiner's rejection of Claim 1 under 35 U.S.C. § 103 as being unpatentable over Henley et al in view of Kawanomoto et al and Hollemann, it is noted that Henley et al is directed to an energy-saving housing and Henley et al provide a teaching of a hot water surface heating device. To the contrary, however, Kawanomoto et al has been cited for teaching walling and ceiling/roof parts made from inorganic materials and a heat insulator made from organic foam materials. It has been further suggested in the Office Action that

Kawanomoto et al would be obviously combinable with Henley et al. Applicant notes, however, that Kawanomoto et al is directed to a panel and cargo compartment for a truck and has no suggestion for teaching that the structure shown therein can be utilized in a house of the type shown in either Henley et al or Hollemann. In this regard, it is also noted that the only structure in Kawanomoto et al that utilizes parts made of inorganic or organic heat insulating material is for the flooring 3 rather than for the walls or ceiling. In fact, the ceiling 8, 8 comprises gull-wing panels which are pivotable about the central portion of the truck body, as illustrated in Figure 1, and which is not shown as being provided with any insulation material. Thus, it is respectfully submitted that Kawanomoto et al would not be obviously combinable with either Henley et al or Hollemann insofar as such would destroy either of such references for their intended purpose and function if an attempt was made to combine the teachings of Kawanomoto et al therewith. Moreover, even if such references were considered to be combinable, Kawanomoto et al would teach providing walls and ceiling portions so as to have no insulation material, which is not what Applicant presently claims. In view of the foregoing, it is respectfully submitted that Claim 1 patentably defines over the above-noted references.

Considering next then the rejection of Claim 2 under 35 U.S.C. § 103 as being unpatentable over Henley et al in view of Kawanomoto et al and further in view of Hollemann and Elson, it is respectfully submitted that Elson fails to rectify the deficiencies of the remaining references, particularly insofar as Elson has been cited solely for the teaching of providing ceiling parts with a heat transmission coefficient. Accordingly, it is submitted that Claim 2 also merits indication of allowability, particularly insofar as there is no teaching as to the obviousness of the combinability of Elson with the above-noted references and Elson does not overcome the drawbacks mentioned above with regard to the suggested

combination of references and the rejection of Claim 1. It is further noted that the values of the heat transmission coefficient are adequately explained in the present invention, including the advantages thereof and thus should not be considered to be an obvious manner of design choice as suggested by the Examiner.

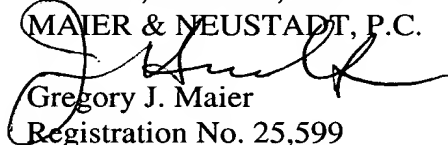
Next considering then the rejection of Claim 3 35 U.S.C. § 103 as being unpatentable over Henley et al in view of Kawanomoto et al and further in view of Hollemann in view of D'Souza, it is submitted that D'Souza also fails to rectify the deficiencies of the remaining references and would not be obviously combinable with such references, particularly in view of the lack of a suggestion in any of the references as to the combinability of the separate features of each of such references.

It is further noted that each of Claims 4-7 and new Claims 8-27 contain limitations having no corresponding teaching or disclosure in any of the above-noted references or any of the remaining references of record. In this regard, Claims 8-27 contain limitations taken from original Claims 1-3, 5, 6 and 7 and thus do not introduce new matter. Accordingly, favorable consideration of such claims is also believed to be in order and the same is hereby respectfully requested.

In view of the foregoing, an early and favorable Office Action is believed to be in order and the same is hereby respectfully requested.

Respectfully submitted,

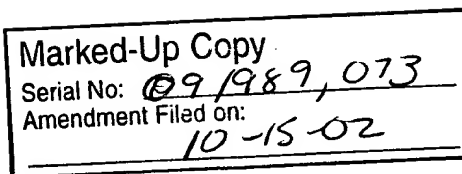
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IN THE SPECIFICATION

Page 3, beginning at line 21, to page 4, line 7, please replace the paragraph as follows:

--The present invention solves the abovementioned problems [in] of the prior [arts] art, and the object thereof is to provide energy-saving housing, wherein comfortable temperatures and humidity conditions can be maintained throughout year with little energy while suppressing loads on cooling and heating devices, healthy living and working spaces can be realized, high airtightness and high heat insulation performance can be maintained for a long period of time, and the durability thereof is excellent.--

Page 12, beginning at line 15, please replace the paragraph as follows:

--As the opening proportion of the wellhole part becomes smaller than 20% of the floor area of the lower floor, transmission of radiant heat from the floor heating device to the upper floor becomes difficult, and the heating effect of the upper floor [lowers] becomes lower[, and]. [as] As the opening proportion becomes higher than 50% of the floor area of the lower floor, the floor area of the upper floor becomes excessively narrow, and the living floor area becomes narrow. This is not economical and insufficient in practicability of the upper floor.--

Page 13, beginning at line 12, please replace the paragraph as follows:

--Thereby, in addition to the actions of the first through fourth aspects, the following

actions are obtained. (1) Since the heat transmission coefficient of the opening is $1.4 \text{ W/m}^2\text{K}$ through $2.5 \text{ W/m}^2\text{K}$, the heat loss amount of the heat leaking from the openings of the window parts and the door parts at the entrance to the outside can be suppressed, high airtightness and high heat insulation of the energy-saving housing can be maintained, and loads on the floor heating device and cooling device of the energy-saving housing can be suppressed, whereby the indoor heating efficiency and cooling efficiency can be increased by a small quantity of energy.--

Page 19, beginning at line 6, please replace the paragraph as follows:

--Fig. 1 is a principal [part section] partially sectional view of a two-storied energy-saving housing according to [an] a first embodiment of the invention;--

Page 19, beginning at line 14, please replace the paragraph as follows:

--Fig. 6 is a principal [part section] partially sectional perspective view showing a programmed ventilator of the energy-saving housing of the embodiment;--

Page 19, beginning at line 17, please replace the paragraph as follows:

--Fig. 7 is a [principal part section] partially sectional view showing a housing ventilation part of the energy-saving housing of the embodiment;--

Page 20, beginning at line 9, please replace the paragraph as follows:

--Fig. 1 is a principal [part section] partially sectional view of the two-storied energy-saving housing of the embodiment, Fig. 2 is an enlarged view of the section A of Fig. 1, Fig. 3 is an enlarged view of the section B of Fig. 1, and Fig. 4 is an enlarged view of the section C of Fig. 1.--

Page 20, beginning at line 14, to page 21, line 19, please replace the paragraph as follows:

--In Fig. 1, the numerical reference 1 denotes the two-storied energy-saving housing of

this embodiment of the invention. Reference number 2 denotes the roof part of the energy-saving housing 1. Reference number 3A denotes the wall part of the second floor of the energy-saving housing 1. Reference number 3B denotes the wall part of the first floor of the energy-saving housing 1. Reference number 4A denotes the floor part of the second floor of the energy-saving housing 1. Reference number 4B denotes the floor part of the first floor of the energy-saving housing 1. Reference number 5A denotes the ceiling part of the second floor of the energy-saving housing 1. Reference number 5B denotes the ceiling part of the first floor of the energy-saving housing 1. Reference number 6 denotes the window parts (openings) with a heat transmission coefficient of 1.4 W/m²K through 2.5 W/m²K formed at predetermined portions of the wall parts 3A and 3B. Reference number 7 denotes a wellhole part, which opens with an opening proportion of 15% through 50% or 20% through 50% of the floor area of the first floor and communicates the first floor and second floor with each other. Reference number 8 denotes a housing ventilation part provided at the top part of the roof part 2. In this embodiment, the opening proportion of the wellhole part 7 does not include the opening proportion of the stairs. Only the window parts 6 are shown as openings, however, the door parts (not shown) of the entrance, kitchen, and the like are also regarded as openings, and are formed so as to have the same heat transmission coefficient of 1.4 W/m²K through 2.5 W/m²K as that of the window parts 6.--

Page 21, beginning at line 23, please replace the paragraph as follows:

--In Fig. 2, reference number 9 denotes the outer roof part of the asbestos straight covered roof part 2. Reference number 10a denotes a structural board for the roof part 2 composed of structural plywood disposed at the lower surface (the ceiling part 5A side) of the outer roof part 9. Reference number 10b denotes a structural board for the roof part 2 composed of structural plywood that is disposed below the structural board 10a via a

ventilation layer 11 of the roof part 2 formed at the lower part of the structural board 10a[.] and 12a denotes a heat insulator for the roof part 2 made from soft foamed urethane of an organic foamed material sprayed on the lower surface of the structural board 10b. Reference number 12b denotes a heat insulator made from soft foamed urethane of an organic foamed material sprayed on the wall part 3A side between the roof part 2 and the ceiling part 5A of the second floor[.] and 13 denotes an eave edge intake louver formed so as to be communicated with the ventilation layer 11 at the edge of the eaves of the roof part 2. Reference number 14 denotes a gutter provided below the eave edge intake louver 13 at the edge of the eaves of the roof part 2.--

Page 22, beginning at line 18, to page 23, line 14, please replace the paragraph as follows:

--Reference number 15 denotes outer walling for the wall parts 3A and 3B. Reference number 16 denotes ventilation layers of the wall parts 3A and 3B formed at the inner side from the outer walling 15, reference number 16a denotes an eave soffit edge portion formed so as to be communicated with the ventilation layer 16 at the upper end part of the ventilation layer 16 below the roof part 2. Reference number 17 denotes windbreak moisture permeative sheets for wall parts 3A and 3B, which are disposed at the inner sides from the outer walling 15 via the ventilation layers 16 and formed of synthetic resin sheets or films. Reference number 18 denotes structural boards for the wall parts 3A and 3B, which are provided at the inner side from the windbreak moisture permeative sheet 17 and formed of structural plywood. Reference number 19 denotes heat insulators for the wall parts 3A and 3B, which are made from soft foamed urethane of an organic foamed material sprayed on the back surfaces of the structural boards 18[.] and 20a denotes inner walling for the wall part 3A made from an inorganic material such as a double plaster board provided at the inner side of

the heat insulator 19. Reference number 21a denotes inner walling made from an inorganic material such as a plaster board provided at the inner side of the ceiling part 5A of the second floor.--

Page 23, beginning at line 15, to page 24, line 13, please replace the paragraph as follows:

--In Fig. 3, reference number 20b denotes inner walling for the wall part 3B made from an inorganic material such as a plaster board provided at the inner side of the heat insulator 19 of the wall part 3B. Reference number 21b denotes the inner walling which is doubly provided and made from an inorganic material such as a plaster board provided at the inner side of the ceiling part 5B of the first floor. Reference number 22 denotes a heat insulator made from soft foamed urethane of an organic foamed material sprayed on the wall part 3B side (heat insulator 19) between the floor part 4A of the second floor and the ceiling part 5B of the first floor. Reference number 23 denotes a wooden floor of the floor part 4A of the second floor. Reference number 24 denotes a structural board formed of structural plywood provided at the lower surface (first floor side) of the wooden floor 23. Reference number 25 denotes a sound insulation board provided on the lower surface of the structural board 24. Reference number 26 denotes a structural board formed of structural plywood provided on the lower surface of the sound insulation board 25. Reference number 27a denotes an airtight packing made from rubber or a high density foamed resin of independent foams, which is provided on the lower surface of the structural board 24 of the floor part 4A at the side of the wall parts 3A and 3B. Reference number 27b denotes a structural member (frame) provided on the lower surface of the airtight packing 27a.--

Page 24, beginning at line 14, to page 26, line 9, please replace the paragraph as follows:

--In Fig. 4, reference number 28 denotes the foundation of the energy-saving housing

1. Reference number 29 denotes a dampproofing sheet provided on the upper end face of the foundation 28. Reference number 30a denotes an airtight packing provided between structure members (groundsels) 30b between the dampproofing sheet 29 and the lower end part of the heat insulator 19 of the wall part 3B. Reference number 31 denotes a draining part formed at the lower end part of the ventilation layer 16 at the upper side of the foundation 28 so as to be communicated with the ventilation layer 16. Reference number 32 denotes a floor heating device formed at the lower side of the floor part 4B. Reference number 33 denotes a filling layer for the floor heating device 32 formed by filling gravel and decomposed granite soil on the ground. Reference number 34 denotes a heat insulator for the floor heating device 32 formed of a plate-shaped foamed member provided by a predetermined length above the filling layer 33. Reference number 35 denotes an upper filling layer for the floor heating device 32 filled above the heat insulator 34. Reference number 36 denotes a dampproofing sheet for the floor heating device 32 spread on the upper surface of the upper filling layer 35. Reference number 37 denotes a floor mold concrete layer for the floor heating device 32 provided on the dampproofing sheet 36. 38 denotes a dampproofing sheet for the floor heating device 32 spread on the upper surface of the floor mold concrete layer 37. Reference number 39 denotes a heat insulator for the floor heating device 32 formed of a plate-shaped foamed member provided on the dampproofing sheet 38. Reference number 40 denotes a heat insulator provided between the heat insulators 34 and 39 along the foundation 28. Reference number 41 denotes a heat accumulating layer for the floor heating device 32 formed from mortar or concrete formed on the heat insulator 39. Reference number 42 denotes a reinforcing mesh which is formed into a grid shape having equal pitches of 100 mm through 150 mm and buried in the heat accumulating layer 41. Reference number 43 denotes

hot water pipes formed of polybutene pipes with a diameter of 16 mm, which are piped above the reinforcing mesh 42 based on the grid of the reinforcing mesh 42 and buried in the heat accumulating layer 41. Reference number 44 denotes plywood provided at the end of the wall part 3B side of the heat accumulating layer 41. Reference number 45 denotes a felt shrinkage absorber formed from fibers of palms provided between the plywood 44 and structure member 30b. Reference number 46 denotes a floor substrate plywood for the floor part 4B provided on the upper surface of the heat accumulating layer 41 of the floor heating device 32. Reference number 47 denotes flooring for the floor part 4B provided on the upper surface of the floor substrate plywood 46.--

Page 28, beginning at line 12, please replace the paragraph as follows:

--On the upper surface of the structural board 10a, a waterproofing sheet is spread, and then tile and [others] other materials are placed thereon.--

Page 28, beginning at line 21, to page 29, line 7, please replace the paragraph as follows:

--In the figure, [the numerical] reference number 48 denotes a boiler for the floor heating device 32 installed outdoors. Reference number 49 denotes a pump for supplying hot water to the hot water pipes 43. Reference number 50 denotes a supply pipe which is connected to boiler 48 via pump 49 and supplies hot water to the respective hot water pipes 43 in each direction. Reference number 51 denotes a collecting pipe (header) to which the respective hot water pipes 43 are connected. Reference number 52 denotes a returning pipe which is connected to the collecting pipe 51 and boiler 48, and returns hot water that has circulated in the respective hot water pipes 43 to the boiler 48.--

Page 30, beginning at line 13, to page 31, line 3, please replace the paragraph as follows:

--Then, shrinkage absorber 45 and plywood 44 are [stood] placed on the heat insulator 39 along the structure member 30b, the heat accumulating layer 41 made from mortar or concrete is formed by a predetermined thickness on the heat insulator 39, and then the reinforcing mesh 42 formed into an equal-spaced grid is laid above the heat accumulating layer 41. Next, as shown in Fig. 5, the hot water pipes 43 are piped into a swirl pattern based on the grid of the reinforcing mesh 42 from the position of the wall part side on which the outside air greatly influences, and the hot water pipes 43 are tied and fixed to the reinforcing mesh 42. Herein, the hot water pipes 43 are piped, as shown in Fig. 5, for the entire first floor excluding sections for which objects are placed on and floor heating is not necessary such as the sink in the kitchen and the location of the bathtub.--

Page 33, beginning at line 3, please replace the paragraph as follows:

--As partitioning walls for the second floor, inner [walling] walls made from an inorganic material as the wall parts 3A and 3B [is] are preferably used. Thereby, the radiant heat from the floor heating device 32 of the first floor can be accumulated in the partitioning walls and the radiant heat can be obtained from the partitioning walls, and this improves heating efficiency and heating performance of the second floor.--

Page 33, beginning at line 16, to page 34, line 11, please replace the paragraph as follows:

--In the figure, [the numerical] reference number 53 denotes air inlets of the programmed ventilator formed in predetermined wall surfaces of each floor of the energy-saving housing 1 so as to be communicated with the outdoor air. Reference number 54 denotes suction ports of the programmed ventilator formed at predetermined positions of the ceiling parts 5A and 5B inside the respective first and second floors of the energy-saving housing 1. Reference number 55 denotes ventilation ducts of the programmed ventilator

provided in the attic of each floor and communicated with the respective suction ports 54. Reference number 56 denotes branching portions of the programmed ventilator which are provided on the attic of each floor and to which the respective ventilation ducts 55 are connected. Reference number 57 denotes a ventilation fan of the programmed ventilator provided on the attic of the first floor and connected to the respective branching portions 56 via the ventilation ducts 55. Reference number 58 denotes an air outlet of the programmed ventilator which is connected to the ventilation fan 57 via the ventilation ducts 55 and formed at a predetermined position in the outer wall of the energy-saving housing 1.--

Page 36, line 2, please replace the paragraph as follows:

--In the figure, reference number 59 denotes a ventilation communicating portion which opens at the top part of the roof part 2 and communicates the ventilation layer 11 and housing ventilation portion 8, reference number 60 denotes ventilation passages of the housing ventilation portion 8 communicated with the ventilation communicating portion 59, and reference number 61 denotes an exhaust opening communicated with the ventilation passages 60 and formed to open at the upper surface of the housing ventilation portion 8. The arrows in the figure show the flows of the outdoor air entering through the ventilation layer 11.--

IN THE CLAIMS

Please amend Claims 1-7 as follows:

--1. (Amended) Energy-saving housing, comprising:

a plurality of wall parts including an inner [walling] wall made from an inorganic material and a heat insulator made from an organic foamed material;

a plurality of ceiling parts including an inner [walling] wall made from an inorganic

material;

a heat insulator made from an organic foamed material provided at one of said ceiling parts [or] and at a roof part; and

a floor heating device provided at least at [the] a floor part of [the] a lower floor, wherein an equivalent clearance area thereof is from $0.1 \text{ cm}^2/\text{m}^2$ [through] to $0.95 \text{ cm}^2/\text{m}^2$ [, preferably, $0.3 \text{ cm}^2/\text{m}^2$ through $0.6 \text{ cm}^2/\text{m}^2$].

2. (Amended) The energy-saving housing according to Claim 1, wherein the heat transmission coefficient of said ceiling parts or said roof part and said wall parts is from $0.1 \text{ W/m}^2\text{K}$ [through] to $0.7 \text{ W/m}^2\text{K}$ [, preferably $0.15 \text{ W/m}^2\text{K}$ through $0.35 \text{ W/m}^2\text{K}$].

3. (Amended) The energy-saving housing according to Claim 1 [or 2], further comprising a programmed ventilator for forcibly ventilating [the whole] all indoor air within the housing.

4. (Amended) The energy-saving housing according to [any one of Claims 1 through 3] any one of Claims 1 through 3 and Claims 8-16, further comprising a wellhole part with a wellhole opening proportion of from 15% [through] to 50%[, preferably 20% through 50%] of the floor area of said lower floor.

5. (Amended) The energy-saving housing according to [any one of Claims 1 through 4] any one of Claims 1 through 3 and Claims 8-16, further comprising a plurality of openings formed in said wall parts with a heat transmission coefficient of from $1.4 \text{ W/m}^2\text{K}$ [through] to $2.5 \text{ W/m}^2\text{K}$.

6. (Amended) The energy-saving housing according to [any one of Claims 1 through 5] any one of Claims 1 through 3 and Claims 8-16, wherein said heat insulator of said wall parts and said heat insulator of said ceiling parts or said roof part [are composed of] comprise soft foamed urethane, a polyethylene foam, crosslinked polyethylene foam, polypropylene

foam, polyurethane foam and urea resin foam which are sprayed on structural boards at [the] an outer wall side of said wall parts and structural boards of at least one of said ceiling parts [or] and said roof part.

7. (Amended) The energy-saving housing according to any one of [Claims 1 through 6] Claims 1 through 3 and Claims 8-16, wherein said floor heating device comprises a heat accumulating layer formed at [the] a lower part of said floor part and a plurality of hot water pipes buried in said heat accumulating layer, and further comprises a reinforcing mesh [that is shaped into] which forms an equal-spaced grid [and] laid at [the] a lower side of said hot water pipes.

8. (New)

9. (New)

10. (New)

11. (New)

12. (New)

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25. (New)

26. (New)

27. (New)

IN THE ABSTRACT

Please amend the Abstract to read as follows:

The invention provides energy-saving housing wherein the indoor temperature condition can be made comfortable throughout the year by a small amount of energy by suppressing loads on cooling and heating devices, and high airtightness and high heat insulation performance can be maintained for a long period of time so that durability is excellent. The energy-saving housing [comprises] includes wall parts provided with inner walling made from an inorganic material and heat insulators made from an organic foamed material, a ceiling part provided with inner walling made from an inorganic material, heat insulators made from an organic foamed material at the ceiling part or roof part, and a floor heating device provided at least at the floor part of the lower floor, and has an equivalent clearance area of from $0.3 \text{ cm}^2/\text{m}^2$ [through] to $0.6 \text{ cm}^2/\text{m}^2$.